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ABSTRACT

This document, which replaces the 1985 national guidelines for emergency medical technician (EMT) continuing education (CE), presents guidelines for designing, implementing, and evaluating CE for EMTs. The introduction explains the process used to develop the revised guidelines. Section 1 discusses the following competency assurance principles underlying development of the revised curriculum: (1) assessment of practice outcomes; (2) assessment of potential to practice; and (3) assessment of professional qualities. Justifications for assessing each item and recommended evaluation methods are also presented. Section 2 details the roles played by state emergency medical services offices and the National Registry of Emergency Medical Technicians in developing and operating emergency medical services (EMS) and in training and certifying EMTs. Section 3 describes the following mechanisms for competency assurance: (1) needs assessment; (2) assurance of knowledge (structured CE, refresher programs, lecture programs and conferences, nationally recognized CE courses, approved self-study, case reviews, grand rounds, sentinel event review, directed studies, teaching); and (3) assurance of skill proficiency (field performance evaluation; hospital clinical performance evaluations; skills workshops; performance examinations; integration of new technology, procedures, protocols, and

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products; evaluation of educational programs). The bibliography lists 29 references. A table detailing advanced-level EMS provider recommended hours of CE is appended. (MN)

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In cooperation with

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HRSA
Health Resources & Human Services Administration
Maternal & Child Health Bureau

EMT-PARAMEDIC AND EMT-INTERMEDIATE CONTINUING EDUCATION

National Guidelines

EMT-PARAMEDIC AND EMT-INTERMEDIATE CONTINUING EDUCATION

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NATIONAL GUIDELINES

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ROLES OF THE STATE EMERGENCY MEDICAL SERVICES OFFICES AND THE NATIONAL REGISTRY OF EMERGENCY MEDICAL TECHNICIANS

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PREFACE

The National Highway Traffic Safety Administration (NHTSA) has assumed responsibility for the development of training courses that are responsive to the standards established by the Highway Safety Act of 1966 (amended). Since these courses are designed to provide national guidelines for training, it is NHTSA's intention that they be of the highest quality and be maintained in a current and up-to-date status from the point of view of both technical content and instructional strategy.

To this end, NHTSA supported the current project which replaces the 1985 EMT-Paramedic and the EMT-Intermediate Refresher Course: National Standard Curricula. This material was developed to be consistent with the recommendations of the *National Emergency Medical Services Education and Practice Blueprint*, the *EMT and Paramedic Practice Analysis*, and the *EMS Agenda for the Future*. These continuing education guidelines are part of a series of courses making up a national EMS training program for prehospital care.

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INTRODUCTION

The explosion in medical knowledge over the last 25 years has increased the demand for continuing medical education. The success of any continuing education program will depend on how well it solves the problems and deficiencies that occur in practice (Ashbaugh & McKean, 1976). This document is designed to give the reader an overview of issues associated with competency assurance mechanisms that can be utilized to promote delivery of medically appropriate patient care, and other considerations for the agencies establishing minimum standards required for credentialing or functioning in the out of hospital setting. The National Highway Traffic Safety Administration document, A Leadership Guide to Quality Improvement for Emergency Medical Systems (DOT HS 808 623, September 1997), is an appropriate reference for the agency or institution interested in learning more about quality improvement in EMS.

Ideally, any local EMS agency would be intimately involved with the development and implementation of a strategic quality planning effort at local, regional and state levels. The reliability of any competency assurance process is dependent on the attributes of the overall continuous quality improvement system. Medical performance is subject to quality control. Continuous advanced training and continuous medical education are essential, and quality must be checked and assured. This includes the structure, its contents, organizational form, framework, and the process of interaction between teachers and participants. The results of CE should show satisfaction and acceptance, increased knowledge, influence on medical treatment and improvement of the success rate of medical treatment (Lipp, 1996).

A competency assurance program is only one component of a comprehensive quality improvement process. A well-designed competency assurance program includes performance and outcome indicators which correlate to the domains and tasks associated with the scope of practice of the personnel. These indicators must be related to measurable objectives that allow for comparison between actual performance and the desired level of performance. The goal of evaluation of the individual providers is to assure that minimum competency, and hopefully improving competency, is demonstrated over time.

A variety of competency assurance mechanisms exist. Since local EMS agencies across the nation and within any state vary widely by call volume, patient population, and number and type of personnel responding to calls, selection of the mechanisms to assure competency should be complementary to those variables. In EMS systems, conclusions about competence have been made based on one or more of the following methods: direct observation of performance in the field, written examinations, performance during simulated patient care events, and attendance at structured educational sessions.

Credentialing agencies have historically arrived at a formula of requirements including some or most of these methods as a basis for renewing credentials associated with EMS practice. In fact, each of these methods has shortcomings and features that compromise the validity of the individual measure. As a result, a combination of most or all of the methods is necessary to maximize the system's confidence in providers' continued competence.

As a practical matter, most professions establish continuing education requirements based on hours. Although this is less than ideal, it remains the most common method of establishing and managing requirements for large groups of professionals. Educationally, hours are not a reliable indicator of quality, efficiency or effectiveness of the instructional activity. Operationally, continuing education based on hours enables employers and individuals to plan, budget, and manage continuing education effectively.

In light of this reality, this document provides guidelines for ranges of continuing education hours by broad topic area. It must be emphasized that these ranges are guidelines developed by experienced educators to help policy makers establish continuing education requirements for the recertification/relicensure of advanced level EMS providers. These hours should be adjusted based on local needs, advances in medical technology and interventions, changes in scope of practice and professional responsibilities, and evidence from the continuous

quality improvement process.

The authors of this document believe that continuing education should move toward a quality assurance model that identifies individual and system areas for improvement and incorporates these topics into the continuing education program. The body of this document provides a model of this type of multi faceted approach. We provide the hours in the appendix as a guideline to help the profession during the transition into a new model of continuing education.

OVERVIEW OF COMPETENCY ASSURANCE PRINCIPLES

Over the years there has been significant focus on the area of licensure and certification in the EMS profession regarding the assessment of personnel on their readiness for practice in the out-of-hospital arena. Professionals as a group are heavily committed to life-long learning. The expanding knowledge base, the increasing sophistication of clientele, the issue of compulsory relicensing all act as forces on the professional and encourage him to keep abreast of developments in his field (Haughey & Murphy, 1983).

The strongest argument for recertification comes from the rapid expansion and perpetually changing nature of knowledge and skills in our profession. Research is producing new knowledge in the health field at an unrelenting pace. Science has made massive strides in the understanding, cure, and prevention of ill health so that life expectancy has been increased two-fold (Nakamoto & Verner, 1973). Within the EMS community there are many pressures to design and develop acceptable models for assuring proper completion of recertification.

Professional accountability requires a self-regulating profession to set and maintain credible, useful standards for its members (Benson, 1991). The EMS community, as well as the public, is demanding accountability throughout the careers of the EMS professional. In fact, The application of the term 'professional' to medical and health practitioners implies, amongst other things, that they have established a knowledge base in initial training and that they accept an obligation to maintain it throughout their careers (Brigley, Young, Littlejohns, & McEwen, 1997). Trends dictate that providers "prove" their ongoing competence.

The model suggested in this document will address two primary areas of concern. The first is competence, which is a measure of minimum proficiency of EMS providers' knowledge and skills. The second is ongoing education, which is designed to assure that the EMS provider obtain "new" knowledge and skills as well as maintain prior knowledge and skills. Underlying the model is the suggestion that credentialing agencies expand the number and types of mechanisms through which a provider can demonstrate competence.

The assessment process used in recertification or relicensure requirements should provide a complete picture of the competence of the EMS professional, and it should have three goals. First, some aspect of the evaluation process should affirm the competence of the EMS provider as demonstrated in actual field performance. Second, the evaluation should defend that the EMS professional has the potential to respond appropriately to a wide range of problems, even though not all situations are commonly seen in the field. Third, recertification or relicensure should convey the professional attitudes and behaviors of the EMS provider. The traditional combination of continuing education and refresher courses addresses only the second of the above goals.

There are three attributes that should be taken into consideration when evaluation for recertification or relicensure is applied to EMS personnel. In each of these attributes additional information will provide insight concerning considerations for justification as well as methods of evaluation.

Attribute 1: Assessment of Practice Outcomes

The first and perhaps most important aspect of a recertification program is an assessment of practice outcomes.

This is achieved by evaluating patient care records to determine if the interventions performed by the EMS provider were in accordance with accepted protocols and standards of care. This method is the most direct and most realistic, but usually is only performed on a subset of all encounters, so the evaluation must be generalized to the provider's entire practice. The evaluation will rarely be representative if the provider changes his behavior as a result of being monitored.

Justification for the Assessment of Outcomes

Outcomes are the ultimate criteria; they provide measures of the consequences of what is actually done in practice. To the EMS provider, assessment of outcomes offers the opportunity to be judged on results, rather than on how those results were obtained. Outcome assessments avoid many of the problems associated with traditional measures of competency (examination scores) because it is a measure of what actually happens in the field setting. Conventional measures place the EMS professional in an artificial situation and assess responses to hypothetical questions or scenarios.

Methods of Evaluation

The methods of evaluation are focused on the results of the practice behavior that occurs in two forms: competencies and new knowledge or cognitive clinical sophistication. It is recommended that each EMS provider successfully demonstrate competencies that will be measured by an acceptable evaluation device in each of the two areas. To reduce threats to reliability, checklists or other criteria developed in accordance with accepted standards of care to guide the evaluator's assessment should be used. In order to be useful in a wide variety of situations, the criteria will be somewhat general, and expert judgement is necessary to apply them consistently. These competencies will be demonstrated within a prescribed period of time that is established by the state EMS office or NREMT.

Attribute 2: Assessment of Potential to Practice

The first attribute, assessment of outcomes, provides assurance to the public and the profession that an EMS provider produces reasonable results given what he or she encounters routinely in the field setting. Beyond these typical patient situations there are important aspects of competence that are faced less frequently. There are new developments (knowledge, devices, and medications) that influence the nature of EMS practice. There are rare circumstances that are known to the EMS system where correct interventions by the provider are critical to maximize the chances of a successful outcome. It is of utmost importance that relicensure and recertification attest to ability in these areas as well.

Justification for the Assessment of Potential to Practice

There are three major reasons to assess the potential to practice. First, in the conduct of this profession, there are patient situations that arise infrequently but have considerable importance in terms of outcomes and where appropriate action by the EMS provider has a significant impact. A practice analysis assists in defining those items that should be taken into consideration for evaluation based upon frequency and criticality of those knowledge and skills components. Since they occur infrequently, these conditions will not be reflected in a typical assessment of outcomes and must therefore be measured in some other fashion to ensure competency in high-stakes patient situations. This will require evaluation in those specific skills outside of the field setting.

Second, the knowledge and practice of professions are transformed over the course of time while a provider is in practice. Recent advancements in the various methods of caring for the out of hospital patient have resulted in the need to assure that individuals are educated to properly intervene. These rapid (and sometimes extensive) changes have significant impact on the quality of the services delivered by a professional and make it imperative to engage in the process of lifelong learning. Moreover, these changes are unlikely to be reflected

immediately in practice outcomes, and consequently, there must be a mechanism for ensuring that the EMS provider is "keeping up" and has the ability to obtain new information when and where appropriate.

Third, the licensure or certification of an EMS provider implies competence in a relatively broad domain. Since some EMS providers will not be afforded the opportunity to be presented with a full spectrum of medical and trauma calls, an assessment of outcomes alone is insufficient to ensure competence in the broader field. Consequently, relicensure and recertification must attest to potential capability in these areas.

Methods of Evaluation

The goal of this component of recertification is to ensure that the EMS provider is able to respond appropriately to those patient situations that are important, new or infrequently encountered. This goal can be achieved by an evaluation system with two complementary facets. The first facet should support and encourage EMS provider to engage in a process of ongoing or continuous learning. A well-structured relicensure or recertification process should encourage the EMS provider to learn, or relearn, how to handle all potential patient situations that might be encountered in his or her practice. The second facet should assure that the EMS provider meets minimum standards through the learning and evaluation associated with specialized training programs and other assurance mechanisms. These may include standardized programs of instruction and other structured learning and evaluation sessions. Simulations allow for tailoring of patient types and scenarios to prompt specific behaviors and skills. Entities that award relicensure or recertification, such as the NREMT and each state EMS office, will define what minimum standards must be in place to assure that this facet is appropriately completed. Local EMS agencies may offer or require structured education on topics identified through their quality improvement system as an emerging need.

Attribute 3: Assessment of Professional Qualities

The first two attributes speak to the technical skills, but the practice of any profession goes far beyond these aspects of competence. The third attribute of recertification provides an assessment of the nontechnical facets of competence. Specifically, it reassures the profession and the public that the EMS provider's attitude and behavior are consistent with professional norms; the EMS provider is not impaired; and, the EMS provider maintains appropriate and professional relationships with patients.

Justification for the Assessment of Professional Qualities

There are several reasons to assess the professional qualities of the EMS provider. First, the relationship between the EMS provider and the patient is one of unequal authority by virtue of the special knowledge possessed by the professional. This makes the patient vulnerable to the less than scrupulous practitioner. Inappropriate behavior would not necessarily be evident in an assessment of outcomes or the potential to practice. Second, behaviors and attitudes towards the customers of the EMS agency (patients and others alike) are pivotal to becoming a quality organization. Since relicensure or recertification is the pathway to continuing practice, it must attest to the relevant personal traits and ethical character of the EMS provider.

Similarly, there are various kinds of impairments that might not be apparent in assessment of outcomes or potential. For instance, substance abuse or psychological problems could affect the EMS provider's judgement in certain instances. Such impairment may not be evident in a cognitive examination. Consequently, this component of the relicensure and recertification must attest that the EMS provider is not impaired. If an agency implements a drug testing program as part of their recertification program, it should use currently approved guidelines such as those developed by the Department of Health and Human Services Substance Abuse and Mental health Services Administration.

While the first two attributes for the assessment of EMS provider competency concentrate on absolute

qualifications to practice in the field, the third focuses on a less precise but equally important aspect of competence. A substantial part of professional practice is the interpersonal relationship between the EMS provider and the patient. At all times, the patient deserves to be treated with integrity, compassion, and respect. This aspect of competence is usually not captured in an assessment of outcomes.

Methods of Evaluation

To achieve this third attribute of recertification, information is needed from a variety of sources, including the credentialing authorities (where applicable), colleagues and patients. The purpose of credentialing information is to establish the personal and ethical characteristics of the EMS provider, and to determine whether problematic impairment exists. The production of a competent health practitioner requires effective, cooperative effort from certifying agencies, accrediting agencies, professional boards, and educational institutions. Information exchange among certifiers, accreditors, educators and employers should be liberal. Such exchange must not violate confidentiality, especially in the matter of documents, such as references obtained to verify compliance to standards or criteria required of a candidate, school/program, or employment in evaluating eligibility for certification, accreditation, or employment (Dziekonski, 1989).

The data can come from several sources. The EMS agency administrators or peers can provide information concerning the ethical attributes of a provider. The medical director is also able to detect circumstances that may indicate that recertification or relicensure should not be given. Personnel at hospitals receiving patients may be in a position to provide information that would be taken into consideration for recertification or relicensure. A few states have required criminal background checks as a condition of renewing credentials for this purpose as well. Any time that negative recertification actions are the result of personal or ethical competence, due process should be followed.

ROLES OF THE STATE EMERGENCY MEDICAL SERVICES OFFICES AND THE NATIONAL REGISTRY OF EMERGENCY MEDICAL TECHNICIANS

State Roles

State legislatures have established lead agencies to oversee the development and operation of emergency medical services for the protection of the public. Inclusive of the legislation is the requirement to issue a permit to work that is typically labeled as a certification or license (credential). In addition, the process also establishes requirements for continued maintenance of the credential. State legislatures or rules authorized by those legislatures also establish scopes of practice, which guide practitioners in the type and level of care provided. States may independently establish standards that identify the knowledge, skills and abilities to safely and effectively practice at the entry level of competency or develop these standards in conjunction with a private agency.

Regardless of the relationship between any private agency and state government, the individual practitioner must operate under the laws of the state in which he or she lives and/or practices. States often establish standards, policies and procedures that cover the scope of EMS operations, including requirements for recertification or license renewal. When standards exist, the standard-setting agency has the responsibility to provide information on the interpretation, understanding, development, defensibility and implementation of those standards. Likewise, states have the responsibility to suspend or revoke the credential of a provider within the framework established within state laws or rules.

NREMT Roles

The National Registry of Emergency Medical Technicians (NREMT) issues a certificate of competency that places the individual on the registry of the NREMT after they have met prescribed entry and examination

requirements through processes defined by the NREMT. The NREMT is a non-profit, free standing, non-governmental body. As an independent body, the NREMT Board of Directors has established standards for entry into the NREMT, disciplinary procedures that can lead to revocation or suspension of registration, procedures for review of felony convictions, examination requirements, and requirements for maintenance of registration and re-registration. These standards are developed using committees with membership reflecting a broad base of national input. Committee work is then reviewed by the NREMT Board of Directors and adopted through a consensus process as NREMT policies or procedures. The processes are designed to identify the knowledge, skills and abilities to safely and effectively practice at entry level competency. Once these processes have reached a general level of consensus, based upon science when available, the NREMT Board of Directors establishes them as NREMT standards. Frequently, standards require interpretation for individuals, services, states, and the nation. A role of the NREMT is to explain these standards to those who either are required to maintain the standards of the NREMT or those who choose to maintain the standards of the NREMT. The NREMT does not operate under state law. This means the NREMT has a broad responsibility to maintain independence while establishing acceptable and defensible standards.

MECHANISMS FOR COMPETENCY ASSURANCE

Historically, states and the NREMT have developed "formulas" specifying the amount of continuing education and other structured education required for renewal of certification or re-registration. Many requirements have been established through educated guess and experiences with past practices. Until credible research is conducted about the efficacy of various competency assurance mechanisms, it will be necessary for credentialing agencies to continue making determinations without certainty of the validity of the measurements that they choose to use. Research methodology suggests that one means of increasing validity is through the use of multiple measures or means of assessment; therefore, the more mechanisms that are used as a basis for assessment, the more confidence the agency is likely to have about the validity of the entire process.

Competency-based education, directed toward attainment of specific, behaviorally defined objectives of instruction, requires separate tests of the attainment of each of the competencies. Programmed instruction requires repeated testing to determine whether a pupil is ready to advance to the next phase of the program or needs to be "recycled" through the preceding phase (Eel, 1976)

The most common combinations of mechanisms required for recertification and relicensure have been fixed amounts and categories of continuing education and refresher programs. In some jurisdictions, examinations (written and/or practical) or skill verification is required. The sections that follow are a description of various methods of examination, simulation, direct observation, and educational approaches that should be considered when designing competency assurance requirements.

Needs Assessment

In order for training programs to be effective, administrators and field personnel must first view them as relevant. A valuable tool to determine the training needs of a group is to conduct a needs-assessment. The goal of this assessment is to identify specific performance areas (clinical and non-clinical) that could be improved with training. The importance of conducting a needs-assessment cannot be overstated. Individuals with decision making power will appreciate your taking the time to solicit their opinion on what their training dollars will be spent on. Too often, training programs fail, not because of poor educational content, but because of poor planning and failure to solicit input from stakeholders.

Examples of how to conduct a needs-assessment include:

- Ask the person responsible for Quality Improvement to share information about performance areas that require improvement.

- Survey the system administrators and supervisors
- Survey participants while at courses
- Meet with the Medical Director.
- Review the medical literature for new trends.
- Survey customers (patients, emergency department nurses, physicians and special interest groups)

Upon completion of the needs-survey, the results need to be prioritized and shared with all above stakeholders. The next steps are to establish specific objectives and content for the training program. A review of existing curricula should be performed to determine if it would meet the established needs. If no standardized curriculum exists, then the educator must develop his or her own curriculum.

Assurance of Knowledge

Structured Continuing Education (CE)

While a person may currently be a competent field provider, they may soon become incompetent due to the failure to keep up with constant changes in the art and science of medicine. Continuing education must be designed to keep up with the rapid changes in medicine and to fill voids that are identified by quality improvement programs. Technical and professional persons are at significant risk of becoming outdated in their skills and their knowledge. It is not enough for them to maintain the competence acquired in the years of formal education. In the profession, the information is not static; perpetual change is the norm (Dubin, 1977).

Many different methods that can be used to accomplish the goal of continuing education (CE). With the emergence of computer technology, video and professional journals, there are more opportunities than ever to receive additional meaningful education.

Other professions have developed multimedia interactive educational tools to facilitated access to CE. In one program, a "physician-friendly" educational tool is designed to improve the clinical and history-taking skills of physicians, residents, and medical students on the internet (Hayes & Lehmann, 1996). Similar programs are very promising for EMS continuing education.

Refresher Programs

Refresher programs are a review of the original training program in a condensed number of hours. While ideal for the purpose of remediation, they are not intended to expand the cognitive or psychomotor ability above the entry level. Therefore, refresher courses should not be considered a means of continued expansion of cognitive information and introduction of new psychomotor skills. They are not intended to deliver relevant contemporary information to practitioners who are currently active in the field.

Lecture Programs and Conferences

A popular form of structured CE is lecture-based programs delivered by services, educational institutions, hospitals, state/regional EMS organizations and companies who specialize in symposia. Generally, these programs cover information on the current scope of practice or changes in the art and science, based upon scientific information learned from current medical research. They may also be on the general topics covered in original training programs. Programs of this type may range from single lectures to multi-day/multi-track regional, state or national level conferences.

This type of structured program has the advantage of human delivery and the ability to be interactive with the faculty. Other advantages include a relatively low cost and the ability to deliver information to a large number of people at each session. Some disadvantages may include the lack of individualized instruction and in some

cases the absence of any outcome measurement. The classroom lecture is inadequate to provide the knowledge and skills necessary to apply the new science and technology to everyday patient care. For any continuing education that is conducted in a lecture/classroom format, it is of paramount importance that the instructors be qualified to teach the material.

The Continuing Education Coordinating Board for Emergency Medical Services (CECBEMS) and state EMS offices approve and accredit continuing education offerings. CECBEMS has established a system for evaluating continuing education offerings and assuring potential attendees/participants of the quality of such activities. This process validates the educational integrity of activities, informs prospective participants of such validation, and awards CECBEMS-approved continuing education credit hours to participants. CECBEMS requires the sponsoring agency to submit an application for approval of an activity for continuing education credit. All continuing education activity sponsors must conform to this process and standard when submitting activities for CECBEMS review.

Nationally Recognized Continuing Education Courses

A number of organizations such as the American Heart Association, National Association of EMTs, American College of Emergency Physicians and American College of Surgeons have developed CE courses to improve the cognitive base and psychomotor skills in specific subject areas where improvements in clinical or field performance were needed. These highly structured and intense programs contain many built in mechanisms to ensure quality such as instructor credentialing, high quality educational support materials and measurement of course outcomes.

CE programs should contain a needs assessment for the educational activity to be offered, prepared written educational objectives, description of the means to achieve these objectives, and devising means for evaluating whether the objectives were met (Osteen, 1993). Generally speaking these courses tend to review original training, may introduce new concepts and focus on the current trends in the management of patients. Some examples of these programs would include Advanced Cardiac Life Support, Prehospital Trauma Life Support, Basic Trauma Life Support, and Pediatric Advanced Life Support.

In addition to EMS specific classes and cerifications, many courses are developed nationally, and some are mandated for individuals working in an EMS, public safety, or health care settings. Examples of these include, but are not limited to, OSHA required continuing education. When possible, these courses should be considered when planning and conducting continuing education programs.

Approved Self-Study

In self-education, the locus of control is in the self-educator, whereas, in formal education, the locus of control is in institutions, their representatives, or their prescriptions. Self-education is usually a concentrated effort in one field rather than a general study of many. Self-education is usually applied learning for immediate application to a task. Self -educators are self-motivated, that is, they are committed to achievement in the field of their choice, even when faced with difficulties (Long, 1989).

In addition to the more traditional methods of CE, computer technology, video, interactive videodiscs, books and CE articles offer tremendous opportunities in continuing education. Technology in the past, such as slides, movies, animation, television, videotapes and audience-response systems has generally ended up as either an aid or a substitute for group CE (Manning &Petit, 1987). The videodisc with its capacity to provide demonstrations using quality video images can present high quality simulation when combined with a microprocessor (Allard, 1982). Self paced educational programs can be used "on demand" and allow the learners to complete their learning at times and locations that are convenient to them. The incorporation of interactive video microcomputer simulations into methods courses may provide a means for the student-teacher

to develop classroom teaching skills before actually entering the classroom (Evans, 1985). These programs also may have the advantage of increased retention due to high impact visuals, live footage and demonstrations. They can also be used at remote locations and offer high caliber instruction on demand in rural, suburban and urban areas alike.

The Internet is creating information and communication spaces that are removing the traditional boundaries of time and location; it is truly creating a "global village" (Glowniak, 1995). Computer technology can increase the interactivity with the learner and may integrate outcome measurement as part of the package. The World Wide Web offers the opportunity to transmit not only text, but pictures, sound, and video in an attractively arranged format to users anywhere in the world (Hayes & Lehmann, 1996). Journals offer CE articles on timely medical topics and often integrate outcome measurement with comprehension testing at the end of the article or segment.

With these new resources for continuing education come challenges for educators and regulators alike to think beyond traditional educational paradigms. The potential may extend well beyond CE to original EMS education; the possibilities are endless. Traditional CE programs should attempt to evolve into or include behavioral CE (Bennett & Casebeer, 1995). Behavioral CE is based on the needs of the learner (i.e., learner centered) , rather than on what the teacher wants to teach (i.e., teacher centered), as exemplified by the traditional lecture. Behavioral CE expands programming to include acquisition of skills, judgment and attitudes; that is behavioral CE is performance based.

Behavioral CE programs pursue educational objectives that are learner oriented and based upon the identified needs of specific target groups. Test objectives should be realistic, attainable, relevant, and measurable. The program should result in either reinforcement of existing skills or adoption of new skills for immediate application to practice. Behavioral CE emphasizes self-directed and interactive discussion through less formal workshops and problem based learning (Davis, 1997). So too are the challenges to ensure sufficient structure and accountability to maintain credibility following completion of these self-directed programs. There are some disadvantages that include production costs, the need for access to appropriate playback equipment and the potential for poor accountability.

To be used effectively, these programs must be developed by credible sources, be medically accurate and educationally sound. These programs should be accredited by states, CECBEMS or other accrediting bodies and include some form of outcome measurement.

Case Reviews

Workshops that provide opportunity for case discussion and rehearsal of practice behaviors are considerably more effective than are more didactic programs (Davis, Thomson, Oxman, & Haynes, 1992). Case reviews are retrospective critiques of actual responses. The materials needed for each review are the patient care report, audiotapes of dispatch and on-line medical consultation, and printouts of ECGs or other summaries generated by automated equipment. The physician medical director, another physician designated by the medical director, or a surrogate medical director should conduct these reviews either with individual providers who were on the selected response, or in groups covering multiple responses.

Cases may be selected randomly, or based on critical criteria such as patient condition or concerns about performance. These reviews can yield valuable insights for the EMS provider based on the reviewer's analysis and clinical sophistication, but can readily be perceived as a punitive event by the provider(s). Other advantages are that the case reviews are "real" and as such may be more interesting to the provider, and the types of reviews conducted can be tailored to the individual service needs. On the other hand, locating the documentation and preparing for the review can be time consuming, and the calls reviewed may not be representative of those typically received by the service.

Grand Rounds

Grand rounds may be feasible in communities with a medical care facility. If the facility has a patient population of adequate diversity and severity, and providers are permitted to attend grand rounds presentations, a unique learning opportunity is possible. The provider is exposed to the wider continuum of patient care, can interact with other members of the health care team, and experience a higher level of cognition about patient conditions and recovery than would normally occur in the out-of-hospital setting. While the presentations will be limited to the patient population found in the facility, and their conditions or topics presented at the ground rounds session may not be directly relevant to an out-of-hospital application, it will widen the paramedics perspective.

Sentinel Event Review

A sentinel event is an unexpected occurrence involving death or serious physical or psychological injury or risk thereof. Serious injury specifically includes loss of limb or function. The phrase "or risk thereof" includes any process variation for which a recurrence would carry a significant chance of serious adverse outcome. A process ensuring that sentinel events are reported within five business days should be incorporated. A thorough root cause analysis should occur within thirty days of the sentinel event. Following the review, a plan for implementation to reduce risk should follow. The plan must be monitored to evaluate its effectiveness relative to the root cause.

Directed Studies

Directed studies, i.e., "literature reviews," can be a valuable learning experience. The review should be defined by an EMS instructor, professor, or medical director, and include a written analysis by the provider of his findings during the review. These studies can be geared specifically to the topical needs of the provider, and are especially well suited to capture information about new or emerging subjects. Findings from the review may also lead to systems advances through the revision of protocols and revision of training material. This alternative presumes that access to peer-reviewed or comparable literature exists, and that the provider is capable of understanding research design and performing a critical analysis. The time required of an instructor to supervise and review this process is an additional disadvantage.

Teaching

Teaching EMS related programs represents an important attribute to the EMS profession. Teaching is seen as comprising six main functions: planning, communicating, providing resources, counseling, assessing, and continuing self-education (Rotem & Abbatt, 1982). As such, this activity should be recognized by the EMS system as an acceptable component of continuing education. It has been said, "to teach is to learn twice." Those who regulate continuing education credit should award those who elect to assist the growth of the profession by teaching. The most common ways to provide instruction are by serving in roles such as lecturer, lab instructor, clinical preceptor, field preceptor, and mentor.

In general, every hour of instruction requires about three hours of preparation. With this in mind, it seems appropriate that relicensure and recertification account for those EMS providers who seek to spend time necessary to teach peers, colleagues and others.

Serving in the role of lecturer should be readily accepted as a means of obtaining continuing education credits. The EMS provider who elects to use instruction as part of their continuing education credits, must remember that credit may only be awarded once in a recertification or relicensure cycle. This means that the EMS provider cannot teach the same lesson multiple times and obtain credits for it each time.

In the role of lab instructor, the EMS provider shares knowledge, demonstrates skills and evaluates students in the classroom setting. This is an essential component of instruction for EMS personnel. Credits should be awarded to those who elect to assist in this area of instruction. Again, credit should not be awarded repeatedly, and should only apply to the subject matter being taught.

Clinical preceptors assure that students are provided the opportunity to demonstrate psychomotor skills in the hospital setting. EMS providers who serve in the role of clinical preceptors should be awarded credit related to the skills/domains that they evaluate.

Field preceptors assure that students are able to demonstrate the skills appropriately in the field setting. These individuals are usually working already and have gone beyond the call of duty to assist future EMS providers. Demonstrable current expertise is necessary to adequately perform this function, and credit for this role should be awarded.

Mentoring is an important component for the EMS profession to continue to grow and prosper. A mentor is someone who fosters development to produce a worthy successor. Mentoring is a living, changing, developmental process (Warren, 1987). Mentors are individuals who possess knowledge and skills and are willing to take on a protegee in a structured fashion and share insight and wisdom about various aspect of the profession. Mentors are experienced, master teachers with an interest in and commitment to the profession. They understand learning as an active social and constructive process and are supportive of instruction consistent with this view (University of Pittsburgh School of Education, 1993).

The EMS professional's willingness to teach must be recognized, as it is a product of his time and expertise. Without question, the act of teaching enhances personal growth and development. The state EMS office and the NREMT will determine the value of this service.

Assurance of Skill Proficiency

Field Performance Evaluation

Performance of skills in the field setting serves as the most reliable means of verifying skill competence. Additional time outside of the normal working hours is required for this method. Because there is direct patient contact in the typical out-of-hospital setting, it serves as a credible way to assure skill competence.

Verifying skill competence through field performance may be difficult due to a potential lack of diverse patient presentations or adequate call volume in the EMS system. Due to the sporadic nature of EMS response, it may also be difficult for clinical experts to be available for direct observation while providers are performing skills in the out-of-hospital setting.

The skill must be documented on a recognized, system-specific patient care record that becomes part of the entire patient care record. The out-of-hospital patient care record is submitted to the regulatory agency for review as part of the continuous quality improvement process. The regulatory agency should review the documented skill performance as an expression of the success rate of the skill rather than simply the total number of times the skill was attempted or the number of times the skill was completed successfully. It is more pertinent to know that the provider was successful in establishing an IV 86% of the time in one month rather than knowing they merely started a total of 5 IVS that month (which may have been the result of 14 attempts). This type of measure must take patient conditions and scene circumstances into consideration.

As part of the continuous quality improvement process, external review of the documented skill must verify that the care delivered to the patient was appropriate based upon patient need and was in compliance with

approved system protocols. The medical director or field supervisor can also accomplish this through direct field observation. Satisfaction and performance surveys may be distributed and completed by the patient, receiving physician, ED administrators, nursing professionals, and on-line medical directors.

There is significant evidence that skills and knowledge deteriorate quickly without reinforcement. For that reason, continuing education should be provided in clinical and patient presentations with infrequent contact, and in skills that are rarely performed.

Hospital Clinical Performance Evaluations

Another method to verify continued competence of skills is through supervised patient interactions in a clinical setting. In this method, the EMS provider may perform skills and procedures on a diverse patient population in a relatively small period of time. Other allied health professionals who possess higher levels of expertise are frequently involved in precepting EMS providers in these settings, thereby potentially improving relations with EMS. Preceptors should have predefined objectives and measurement instruments to document the various procedures completed.

Objective structured clinical examinations using standardized patients are being used to teach and assess the clinical competencies of medical students and residents. These clinical competencies include history taking, information giving, counseling, clinical reasoning, differential diagnosis, and communication skills (O'Brien, Feldman, Alban, Donoghue, Sirkin, & Novack, 1996).

Since EMS providers do not normally function in the clinical environment, various drugs, devices and interventions outside of the field domain may present some confusion for the EMS provider who is performing skills in the clinical setting. Some facilities may not permit EMS providers to gain experience in the clinical setting due to potential liability concerns.

To base CE interventions on identified clinical needs, however, new linkages for CE providers will need to be found in health services research, in hospitals, in provincial or state-generated data sources, from insurance carriers, and within managed care systems (Davis, Thomson, Oxman, & Haynes, 1995).

Skills Workshop

Performing skills on simulated patients given a scenario is another means of verifying skill competence. These supervised sessions may be conducted by the service at the local level or provided by some other recognized external agency. All skills should be documented in accordance with predefined objectives and measurement instruments. The simulated victims utilized in these skills sessions should be moulaged and programmed to respond as a real victim would given a similar encounter in the out-of-hospital setting. No simulation of equipment or procedures should be permitted and manikins should be utilized for the skills session whenever performance of certain skills on live subjects might be inappropriate or dangerous.

Skills workshops present little risk to the actual patient population and permit repetitive practice of the skill until mastery is developed. These sessions permit tailoring of skills to be practiced based upon the demonstrated abilities of the EMS provider. However, these sessions may be cost and resource intensive. Practicing skills on manikins or programmed patients may not provide adequate evaluation of an EMS provider's true capabilities in a real out of hospital situation. There is also potential for inappropriate techniques to be perpetuated if the same party who introduced them incorrectly in the first place supervises the skill sessions.

Performance Examinations

Some agencies may permit or require examinations, both written and practical, to be utilized in lieu of other methods of competency assurance. Concluding that competence has been assured through examination results is only reliable if the measurement tool yields valid results. However, it is inappropriate to base such an important judgement as assurance of competency on only one measurement. Therefore, the mechanisms selected to assure competence must be acceptable to the agency that will recertify, relicense, or reregister the EMS provider.

Written and practical performance examinations are a cost-effective means to verify competence. They can be administered in a minimal amount of time and cover a wide domain of practice. Results from these exams can be quickly tabulated to assist with making timely decisions. There is little if any predictive validity in these results and it is very difficult to validate or set standards.

Integration of New Technology/Procedures/Protocols/Products

As previously stated, the rate of change in medical science and technology is rapid. While original education provides the foundation for practice in EMS, continuing education is essential to keep up with the rapid changes in the art and science of emergency medicine. When new equipment is introduced, training is required to allow its safe introduction into field practice. The same applies to new medications, policies and procedures. To ensure continued competency, local EMS operations must have a mechanism to deliver training on service or system specific changes in a timely manner. This is a critical function of local medical direction and system administrators who must verify that personnel are competent in local/regional equipment, policies, and procedures. For every system change, verification of the training and implementation process must be documented.

Evaluating Educational Programs

The expectation of educational programs is to change behavior. At the completion of the program, everyone should have assurance that the goals were met. Evaluation is also conducted to decide if the program should be continued and to gain information on how to improve future programs. The "Kirkpatrick Model" is a commonly used tool for evaluating education. This four level approach will provide a comprehensive analysis of the educational program, including return on investment. The four levels are all important, however as you advance from level to level, the process becomes more difficult.

Level 1 evaluation focuses on the learner's reaction and is typically accomplished by post course questioning of participants to determine their satisfaction with the education. Measuring reaction is important as it provides the educator with immediate feedback about the learning process. Instructors will benefit from feedback so that they can improve future presentations.

Level 2 evaluation determines if the learning has occurred. This is typically accomplished using a written and/or practical evaluation relative to the program objectives.

Level 3 evaluation focuses on job performance and application of the education to real life situations. Behavioral evaluation determines if the student is applying his or her enhanced knowledge on the job. Evaluating behavior is more difficult than the previous two levels.

Level 4 evaluation asks the ultimate question, "has the education had a positive effect on patient outcomes?" While this is the most basic of educational evaluation questions, is it also the most difficult to evaluate. Patient outcomes have many variables, are not always easy to measure, and often require huge numbers of exposures to demonstrate a significant difference. This level of evaluation is very difficult to conduct. (Kirkpatrick, 1996).

SUMMARY

It is of utmost importance that assessment procedures and processes used in recertification and relicensure programs provide a complete picture of the competence of the EMS provider. These processes should have three goals. First, some aspect of the evaluation should determine the competence of the EMS provider in actual practice. The first attribute of a relicensure or recertification program would ideally achieve this goal through an assessment of outcomes of professional activity. Since outcome evidence is not widely available some process-related outcomes must take place in some areas.

Second, the evaluation should determine that the EMS provider is able to respond appropriately to a wide range of patient situations that he or she does not routinely see in the field setting.

Third, in acknowledging that the practice of the EMS provider requires much more than achievement of reasonable outcomes and adequate potential, recertification and relicensure should attest to the interpersonal and behavioral characteristics of the EMS provider.

Since no single method can accomplish these goals, it is suggested that a combination of techniques and methodologies are used as a part of a comprehensive continuing education program. It is important to point out that considerable work remains specifically in the out-of-hospital arena for EMS personnel to assure that reasonable measuring devices are created for determining competence of EMS providers.

REFERENCES

Allard, K.E. (1982). The videodisc and implications for interactivity. Paper presented at the Annual Meeting of the American Education Research Association. New York, NY, March 19-23.

Ashbaugh, D.G., & McKean, R.S. (1976). Continuing medical education. The philosophy and use of audit. Journal of the American Medical Association, 236, 1485-1488.

Bennett, N.L., & Casebeer, L.L. (1995). Evolution of planning in CME. Journal of Continuing Education in Health Professions, 15, 70-79.

Benson, J.A. (1991). Certification and recertification: One approach to professional accountability. Annals of Internal Medicine, 114, 238-242.

Brigley, S., Young, Y., Littlejohns, P., & McEwen, J. (1997). Continuing education for medical professionals: A reflective model. Postgraduate Medical Journal, 73, 23-26.

Conn, R.B. (1992). Can continuing medical education prepare the current practitioner for the 21st century? Arch Pathol Lab Med, 116, 602-604.

Curry, L., Wergin, J. F. and Associates (1993). Educating Professionals - Responding to New Expectations for Competence and Accountability. Jossey-Bass Publishers, San Francisco.

Davis, D.A., Thomson, M.A., Oxman, A.D., & Haynes, R.B. (1995). Changing physicians performance. A systematic review of the effect of continuing medical education strategies. Journal of the American Medical Association, 274, 700-705.

Davis, D.A., Thomson, M.A., Oxman, A.D., & Haynes, R.B. (1992). Evidence for the effectiveness of CME. A review of 50 randomized controlled trials. Journal of the American Medical Association, 268, 1111-1117.

Davis, P. (1997). Editorial. Physicians: Our greatest potential resource for continuing medical education. The

Journal of Rheumatology, 24, 1670-1672.

Dubin, S.S. (1977). A learning model for updating older technical and professional persons. Paper presented at the Annual Meeting of the American Psychological Association. San Francisco, California, August 26-30.

Dziekonski, C.B. (1989). What information should a certification program provide to schools and accreditation bodies? Needs for establishing cooperative linkages. Paper presented at the Annual Conference of the National Organization for Competency Assurance. Alexandria, VA, December 1-2.

Eel, R.L. (1976). The paradox of educational testing. National Council on Measurement in Education. E. Lansing, Michigan, Volume 7, Number 4.

Evans, R.J. (1985). Preserve special education: Interactive video stimulation. Reports - Descriptive, 141, 16.

Glowniak, J.V. (1995). Medical resources on the Internet. Annals of Internal Medicine, 123, 123-131.

Haughey, M.L., & Murphy, P.J. (1983). The continuing professional education interactive satellite interface. Paper presented at the Joint Conference of the Northwest Adult Education Association and Alaska Education Association. Anchorage, AK, May.

Hayes, K.A., & Lehmann, C.U. (1996). The interactive patient: A multimedia interactive educational tool on the world wide web. M.D. Computing, 13, 330-334.

Lipp, M. (1996). Quality assessment in continuous medical education. Anaesthetist, 45, 363-371.

Long, H.B. (1989). Selected principles developing self-direction in adult learning. Paper presented at the Annual Meeting of the American Association for Adults and Continuing Education. Atlantic City, NJ, October.

Manning, P.R., & Petit, D.W. (1987). The past, present, and future of continuing medical education.

Achievements and opportunities, computers, and recertification. Journal of the American Medical Association, 258, 3542-2546.

Nakamoto, J., & Verner, C. (1973). Continuing education in health profession. Review of the literature 1960-1970. Paper presented at the Syracuse University of New York, Eric Clearinghouse on Adult Education. New York, NY.

Norcini, J. J. and Shea J. A. Increasing Pressures for Recertification and Relicensure

O'Brien, M.K., Feldman, D., Alban, T, Donoghue, G., Sirkin, J., & Novack, D.H. (1996). An innovative CME program in cardiology for primary care practitioners. Academy of Medicine, 71, 894-897.

Osteen, A.M. (1993). 25 years in continuing medical education. The silver anniversary of the AMA PRA. Journal of the American Medical Association, 270, 1092-

Rotem, A., & Abbatt, F.R. (1982). Self-assessment for teachers of health workers. How to be a better teacher. WHO Offset Publication, No. 68. World Health Organization, Geneva, SW, p. 63.

Texas State Technical Institute (1987). Implementing Competency Based Education. A Resource Guide. Amarillo, TX

University of Pittsburgh School of Education (1993). Intern Teaching Handbook. Guidelines, Policies, and Procedures Recommended for Interns, Mentors, and Supervisors. University of Pittsburgh, PA, March 24.

Warren, S.F.(1987). Research mentorship: Ethical issues. Research Mentorship and Training-Proceedings, 109.

APPENDIX A

ADVANCED LEVEL EMS PROVIDER
RECOMMENDED HOURS OF CONTINUING EDUCATION

These guidelines represent expert opinion of a multi-disciplinary group in the absence of empirical data. The ranges are grouped by broad topic area referencing the EMT-Paramedic and EMT-Intermediate: National Standard Curricula. It must be emphasized that these ranges are guidelines developed by experienced educators to help policy makers establish continuing education requirements for the recertification/relicensure of advanced level EMS providers. These hours should be adjusted based on local needs, advances in medical technology and interventions, changes in scope of practice and responsibilities, and evidence from the continuous quality improvement process.

Module	Recommended hours per year
PREPARATORY: Suggested topics include: EMS Systems/The Roles and Responsibilities of the Paramedic, The Well-Being of the Paramedic, Illness and Injury Prevention, Medical / Legal Issues, Ethics, General Principles of Pathophysiology, Pharmacology, Venous Access and Medication Administration, Therapeutic Communications, Life Span Development	**3-5**
AIRWAY MANAGEMENT AND VENTILATION: Suggested topics include: Airway Management and Ventilation	**3-5**
PATIENT ASSESSMENT: Suggested topics include: History Taking, Techniques of Physical Examination, Patient Assessment, Clinical Decision Making, Communications, Documentation	**2-4**
TRAUMA: Suggested topics include: Trauma Systems/Mechanism of Injury, Hemorrhage and Shock, Soft Tissue Trauma, Burns, Head and Facial Trauma, Spinal Trauma, Thoracic Trauma, Abdominal Trauma, Musculoskeletal Trauma	**3-4**

MEDICAL: Suggested topics include: Pulmonary, Cardiology, Neurology, Endocrinology, Allergies and Anaphylaxis, Gastroenterology, Renal/Urology, Toxicology, Hematology, Environmental Conditions, Infectious and Communicable Diseases, Behavioral and Psychiatric Disorders, Gynecology, Obstetrics	**9-12**
SPECIAL CONSIDERATIONS: Suggested topics include: Neonatology, Pediatrics, Geriatrics, Abuse and Assault, Patients with Special Challenges, Acute Interventions for the Chronic Care Patient	**3-4**
OPERATIONS: Suggested topics include: Ambulance Operations, Medical Incident Command, Rescue Awareness and Operations, Hazardous Materials Incidents, Crime Scene Awareness	**1-2**
TOTAL	***24-36***